EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Gerson Panitch on January 27, 2010.

The application has been amended as follows:

Please replace the prior listing of claims with the following list of claims:

72. (Currently Amended) A method for ~~creating~~ forming structures on an electrically conductive surface of a substrate, comprising:

providing a master electrode for receiving soluble anode material, the master electrode having an electrically conductive surface less soluble than the soluble anode material, and an insulating pattern layer arranged directly on the less soluble surface, the insulating pattern layer cooperating with the less soluble surface to define at least one cavity substantially devoid of soluble anode material;

positioning the master electrode in electrical contact with the soluble anode material using an electrolyte solution;

depositing a quantity of soluble anode material on the less soluble surface of the cavity, wherein the arranging of the insulating pattern layer

directly on the less soluble surface prevents soluble anode material from being disposed between the less soluble surface and the insulating pattern layer;

bringing the master electrode in close contact with the electrically conductive surface of the substrate; and

plating at least one pattern structure on the substrate by electrochemically transporting, through an electrolyte solution, the soluble anode material from the cavity to the electrically conductive surface of the substrate, wherein the insulating pattern layer is arranged directly on the less soluble surface in a manner substantially preventing undercutting of the insulating pattern layer during plating.

73. (Previously Presented) The method according to claim 72, wherein the electrically conductive surface of the master electrode is chemically inert with respect to the electrolyte solution used.

74. (Previously Presented) The method according to claim 72, further including supplying an external plating voltage in such way that the electrically conductive surface of the substrate becomes a cathode and the master electrode becomes an anode in local electrochemical plating cells, the plating cells being defined by the at least one cavity.

75. (Previously Presented) The method according to claim 73, further including supplying an external plating voltage in such way that the electrically conductive surface of the substrate becomes a cathode and the master electrode becomes an anode in local electrochemical plating cells, the plating cells being defined by the at least one cavity.

76. (Previously Presented) The method according to claim 72, wherein the anode material is deposited in the cavity with electrochemical deposition, using an electrochemical cell, the electrochemical cell being defined by the cavity.

77. (Previously Presented) The method according to claim 72, further including applying an external etching voltage in such way that the electrically conductive surface of the substrate becomes an anode and the master electrode becomes a cathode in a local electrochemical etching cell, the cell being defined by the cavity.

78. (Previously Presented) The method according to claim 73, further including applying an external etching voltage in such way that the electrically conductive surface of the substrate becomes an anode and the master electrode becomes a cathode in a local electrochemical etching cell, the cell being defined by the cavity.

79. (Previously Presented) The method according to claim 72, wherein residual material deposited in the cavity is removed in a subsequent cleaning process.

80. (Previously Presented) The method according to claim 79, wherein the cleaning process includes electrochemical etching of the material deposited in the cavity using either a conventional electrochemical etching cell or local electro chemical cell, the cell being defined by the cavity.

81. (Previously Presented) The method according to claim 72, wherein the electrically conductive surfaces of the master electrode and the substrate comprises an electrically conductive material.

82. (Currently Amended) The method according to claim 81, wherein at least one of the electrically conductive surfaces of the master electrode ~~and the substrate~~ is chosen from the group comprising stainless steel, platinum, palladium, gold, nickel, titanium, aluminum, and chromium, ~~and~~ wherein the ~~group~~ substrate further comprises at least one of copper ~~as an electrically conductive surface of the substrate~~ and an electrically conductive material durable to electrochemical stresses.

83. (Previously Presented) The method according to claim 72, wherein a semiconductor structure is formed on the electrically conductive surface of the substrate.

84. (Previously Presented) The method according to claim 72, wherein a conductive polymer structure is formed on the electrically conductive surface of the substrate.

85. (Previously Presented) The method according to claim 72, further including using applying a pulsed voltage applied between the master electrode and the substrate.

86. (Previously Presented) The method according to claim 85, wherein a frequency of the pulsed voltage is in a range of about 2 to about 20 kHz.

87. (Previously Presented) The method according to claim 85, wherein a frequency of the pulsed voltage is about 5 kHz.

88. (Previously Presented) The method according to claim 85, wherein the pulsed voltage is a periodic pulse reverse voltage.

89. (Previously Presented) The method according to claim 85, wherein the pulsed voltage has complex waveforms.

90. (Previously Presented) The method according to claim 72, wherein the electrolyte solution includes at least one of a concentration of electro-active ions of about 10 mM to about 1200 mM in the electrolyte solution and a sequestering agent.

91. (Previously Presented) The method according to claim 90, wherein the sequestering agent is EDTA.

92. (Previously Presented) The method according to claim 72, wherein an additive system is used in the electrolyte solution, the additive system comprising at least one of wetting agents, accelerators, suppressors, and levelers.

93. (Previously Presented) The method according to claim 72, wherein the electrolyte solution has little or no supporting electrolyte and at least one of a high concentration of electro-active species and no chemical oxidation agent.

94. (Previously Presented) The method according to claim 72, wherein counter ions in the electrolyte solution are exchanged to ones which provide higher solubility.

95. (Previously Presented) The method according to claim 72, wherein the electrolyte solution comprises acid copper and the electrolyte solution has a pH value of from about 2 to about 5.

96. (Previously Presented) The method according to claim 93, wherein the electrolyte solution is an optimized electrolyte in a local etching cell or a local plating cell.

97. (Currently Amended) The method of claim 72, further comprising successively reusing the master electrode to fabricate replica structures ~~plating a pattern on multiple electrically conductive substrates, and wherein the method includes substantially emptying the cavity of soluble anode material between plating of successive substrates~~.

98. (Currently Amended) A method for ~~creating~~ forming structures on an electrically conductive surface of a substrate, comprising:

providing a master electrode for receiving soluble anode material, the master electrode having an electrically conductive surface less soluble than the soluble anode material and an insulating pattern layer arranged directly on the less soluble surface, the insulating pattern layer cooperating with the less soluble surface to define at least one cavity substantially devoid of soluble anode material;

positioning the master electrode in electrical contact with the soluble anode material using an electrolyte solution;

depositing a quantity of soluble anode material on a surface in the cavity less soluble than the anode material, wherein the arranging of the insulating pattern layer directly on the less soluble surface of the master electrode prevents soluble anode material from being disposed between the less soluble surface and the insulating pattern layer;

bringing the master electrode in close contact with the electrically conductive surface of the substrate; and

plating at least one pattern structure on the substrate by electrochemically transporting, through an electrolyte solution, the soluble anode material from the cavity to the electrically conductive surface of the substrate, wherein the insulating pattern layer is arranged directly

on the less soluble surface in a manner substantially preventing undercutting of the insulating pattern layer during plating.

99. (Currently Amended) The method of claim 98, further comprising successively reusing the master electrode to fabricate replica structures ~~plating a pattern on multiple electrically conductive substrates, and wherein the method includes substantially emptying the cavity of soluble anode material between plating of successive substrates~~.

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

The instant invention is distinguished over the prior art of record by a method for forming structures on an electrically conductive surface of a substrate, comprising: providing a master electrode for receiving soluble anode material, the master electrode having an electrically conductive surface less soluble than the soluble anode material, and an insulating pattern layer arranged directly on the less soluble surface, the insulating pattern layer cooperating with the less soluble surface to define at least one cavity substantially devoid of soluble anode material; depositing a quantity of soluble anode material on the less soluble surface of the cavity, wherein the arranging of the insulating pattern layer directly on the less soluble surface prevents soluble anode material from being disposed between the less soluble surface and the insulating pattern layer; and plating at least one pattern structure on the substrate by electrochemically transporting, through an electrolyte solution, the soluble anode

material from the cavity to the electrically conductive surface of the substrate. The prior art of record neither teaches nor suggests the combination of limitations recited in the instant claims.

Cohen teaches that electroplating article can consist of a patterned mask on an anode. The anode can be soluble or insoluble, and can include an erodable layer supported by a conductive material that does not erode (column 7 lines 50-52). For a soluble anode, the anode can be redressed, i.e. deposited, periodically by reversing the polarity of the anode and plating back onto the anode of the negative features of the mask (column 7 lines 54-57). Cohen, however, does not disclose the combination of arranging the patterned mask directly on the insoluble surface of the anode, depositing a quantity of soluble anode material on the insoluble surface of the anode, and then plating the soluble anode material from the cavity.

Since the prior art of record neither teaches nor suggests the combination of steps recited in the instant claims, one skilled in the art would not have been motivated to perform the claimed process.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUAN V. VAN whose telephone number is (571)272-8521. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

/Luan V Van/
Examiner, Art Unit 1795
January 28, 2010